PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-059526
(43)Date of publication of application : 26.02.2002

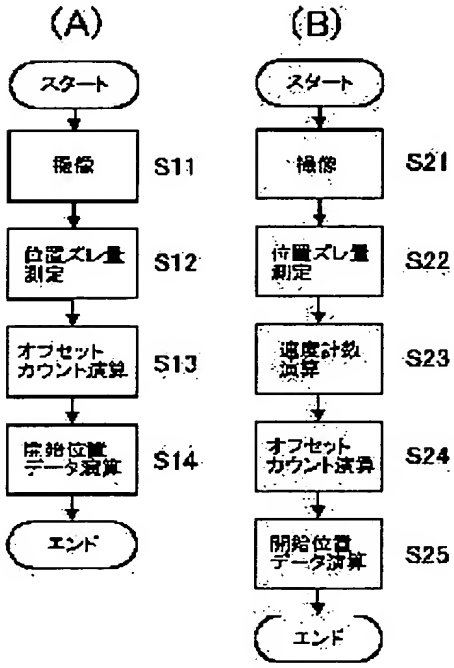
(51)Int.Cl. B41C 1/00
B41C 1/10
B41F 33/14
B41J 29/44
B41J 29/52

(21)Application number : 2000-245979
(22)Date of filing : 14.08.2000

(71)Applicant : DAINIPPON SCREEN MFG CO LTD
(72)Inventor : EDAMITSU KENJI
KAKIMOTO SHOJI

(54) PRINTING APPARATUS

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a printing apparatus which can correct the recording position of an image easily by inputting the positional dislocation quantity of printed matter.
SOLUTION: In the printing apparatus, in the step S11 of Fig. (A), an image on printing paper is read by a camera part. In the step S12, the obtained image data are image-processed by a control part, and the position of each register mark is operated. In the step S13, an offset count number for determining an image recording starting position is obtained from the obtained positional dislocation quantity. In the step S14, the obtained offset count number is stored, and start position data are obtained.



LEGAL STATUS

[Date of request for examination] 03.06.2003
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number] 3488186
[Date of registration] 31.10.2003
[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] It has an image recording means to record an image on the printing version on a printing cylinder based on the image data which constitutes printed matter. An input means to be the airline printer which can amend the record location of said image, and to input the amount of location gaps of the printed matter measured in at least two places of the image upper limit section and the image lower limit section in a printing cylinder hand of cut to the image which constitutes printed matter, A starting position data operation means to calculate the starting position data which define the starting position at the time of image recording based on the amount of location gaps of the upstream at the time of image recording among said inputted amounts of location gaps of two places, A dimension amendment data operation means to calculate the dimension amendment data which amend the dimension of the image in a printing cylinder hand of cut based on said inputted amount of location gaps of two places, The airline printer characterized by amending the record location in the printing cylinder hand of cut of the image which it **** and is recorded with said image recording means based on the starting position data and dimension amendment data which were obtained.
[Claim 2] Said printing cylinder is an airline printer according to claim 1 which is 2 double drum which equips the hoop direction of the printing cylinder concerned with two printing fields, and is characterized by calculating the starting position data of a proper for every printing field.
[Claim 3] Said printing cylinder is an airline printer according to claim 1 or 2 which is 2 double drum which equips the hoop direction of the printing cylinder concerned with two printing fields, and is characterized by calculating the dimension amendment data of a proper for every printing field.
[Claim 4] Amendment of the dimension of the image in said printing cylinder hand of cut is an airline printer according to claim 1 to 3 characterized by making it attain by changing the rotational speed of a printing cylinder.
[Claim 5] Said input means is what inputs the amount of location gaps of the image pars intermedia between said image upper limit section and the image lower limit section further. Said dimension amendment data operation means It is what calculates the 1st partial dimension amendment data which amends the dimension of the partial image from said image upper limit section in a printing cylinder hand of cut to image pars intermedia based on the inputted amount of location gaps, and the 2nd partial dimension amendment data which amends the dimension of the partial image from said image pars intermedia to the image lower limit section. The airline printer according to claim 1 to 4 characterized by amending the dimension of the image recorded with said image recording means for every part based on the 1st partial dimension amendment data and the 2nd partial dimension amendment data which were obtained.
[Claim 6] The airline printer according to claim 5 characterized by changing the rotational speed of a printing cylinder bordering on said image pars intermedia based on said 1st and 2nd partial dimension amendment data.
[Claim 7] The airline printer according to claim 5 or 6 characterized by establishing two or more points of said image pars intermedia, and performing dimension amendment of the image in the field between each image pars intermedia.

[Claim 8] Said image recording means is an airline printer according to claim 1 to 7 characterized by measuring the amount [in / in said amount of location gaps / the printing cylinder hand of cut of the positioning mark concerned] of location gaps while forming a positioning mark in the image upper limit section and the image lower limit section.
[Claim 9] The airline printer according to claim 1 to 8 characterized by recalculating said starting position data according to amendment of the dimension of said image.
[Claim 10] Said input means is what inputs the amount of location gaps of the printed matter further measured in two places of the image left end section and the image right end section in the direction of an axis of a printing cylinder. With said inputted amount of location gaps of two places The longitudinal-direction starting position data which define the starting position in the direction of a plate cylinder shaft line at the time of image recording, The longitudinal-direction dimension amendment data which amend the dimension of the image in the direction of a plate cylinder shaft line are calculated. The airline printer according to claim 1 to 9 characterized by amending the record location in the direction of a plate cylinder shaft line of the image recorded with said image recording means based on the obtained data.
[Claim 11] The airline printer according to claim 1 to 10 characterized by having an image pick-up means to picturize the image on a print sheet, and a measurement means to measure the amount of location gaps from the obtained image data, in an airline printer.
[Claim 12] A printing conditioning means to have an image recording means to record an image on the printing version on a printing cylinder based on the image data which constitutes printed matter, to be the airline printer which can amend the record location of said image, and to set up printing conditions, An input means to input the amount of location gaps of the printed matter printed according to said printing conditions, A location amendment data operation means to calculate the location amendment data which amend the record location of an image based on said inputted amount of location gaps, The airline printer characterized by having a storage means to memorize said location amendment data corresponding to said printing conditions, choosing location amendment data from said storage means according to printing conditions, and amending the record location of said image based on the selected location amendment data concerned.
[Claim 13] Said printing conditions are the class of print sheet, the thickness of paper of a print sheet, the direction of the eye of paper, the order of a print color, and an airline printer according to claim 12 characterized by including at least one of ********.
[Claim 14] Said printing cylinder is an airline printer according to claim 12 or 13 characterized by using the location amendment data which are 2 double drum equipped with two printing fields, and correspond for every printing field.
[Claim 15] Said airline printer is an airline printer according to claim 12 to 14 characterized by making into printing conditions to have the blanket drum which imprints an ink image from the printing version, and to have exchanged or reequipped with the blanket of the blanket drum concerned.
[Claim 16] Said airline printer is an airline printer according to claim 12 to 15 characterized by amending the record location of said image using the location amendment data with which it has a display means to display two or more location amendment data corresponding to said printing conditions, and the operator chose it from the displayed location amendment data.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the airline printer with a platemaking device equipped with a platemaking means to form an image on a printing cylinder at the printing version based on image data.
[0002]
[Description of the Prior Art] In recent years, the platemaking equipment which forms an image on the printing version based on digital image data, and the airline printer which built the so-called CPT (Computer-To-Plate) equipment into the inside of a plane are put in practical use, for example, it is indicated by the JP,10-272756,A public presentation official report etc. Since it is called the digital printing press and direct printed matter is obtained from image data, while such an airline printer fits multi-form few number-of-copies printing with short working hours etc., it is a selling point that the operator who has not become skillful since the platemaking process etc. is automated can also treat easily.
[0003] He is trying to correct the printing cylinder at the time of assembling an airline printer, and the mechanical error of an encoder in such a digital printing press in the technique indicated by the Patent Publication Heisei No. 507125 [six to] official report, for example.
[0004]
[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional technique, since the bit memory corresponding to the location of all the dots of an image is prepared and he is trying to memorize the location of each dot, an equipment configuration is complicated and the operator of an airline printer cannot make easily. therefore -- although this conventional technique can be carried out as adjustment by the manufacture manufacturer -- the operator of each printing firm -- each time -- carrying out -- as -- a configuration -- **** -- becoming -- **** .
[0005] However, when printing conditions change (for example, when the class of a print sheet or ink, the amount of supply of dampening water, etc. change), the amount of location gaps of printed matter changes. As a direct example, the amount of elongation at the time of the print sheet concerned passing an airline printer according to the direction of the eye of the class of print sheet, thickness, and paper changes. That is, since it is extended whenever the pressure welding of the print sheet is carried out to each blanket drum, when this amount of elongation changes, the amount of location gaps of the color printed first and the color printed at the last changes. Since the elongation especially in the hand of cut of a printing cylinder is large, it has become clear that the amount of location gaps of a printing cylinder hand of cut influences the quality of printed matter more greatly than that of the direction of an axis of a printing cylinder. In addition, also when such location gap exchanges the blanket of a blanket drum, changing a lot is checked.
[0006] in the aim doubling adjustment by change of such printing conditions, provide one adjustment at the time of factory shipments like the above-mentioned conventional technique -- it **, and if required, it must adjust for every activity. Since it was an activity troublesome [adjustment of such an image recording location] for an operator, and difficult, equipment in

which aim doubling adjustment is possible was desired in the easiest possible procedure.
[0007] It is made in order that this invention may solve the above-mentioned technical problem, and it aims at offering the airline printer with which an operator can correct the record location of an image easily.
[0008] Moreover, it aims at offering the airline printer which can perform aim doubling adjustment of an image easily according to change of printing conditions.
[0009]
[Means for Solving the Problem] Invention according to claim 1 is equipped with an image recording means to record an image on the printing version on a printing cylinder based on the image data which constitutes printed matter. An input means to be the airline printer which can amend the record location of said image, and to input the amount of location gaps of the printed matter measured in at least two places of the image upper limit section and the image lower limit section in a printing cylinder hand of cut to the image which constitutes printed matter, A starting position data operation means to calculate the starting position data which define the starting position at the time of image recording based on the amount of location gaps of the upstream at the time of image recording among said inputted amounts of location gaps of two places, A dimension amendment data operation means to calculate the dimension amendment data which amend the dimension of the image in a printing cylinder hand of cut based on said inputted amount of location gaps of two places, It **** and is characterized by amending the record location in the printing cylinder hand of cut of the image recorded with said image recording means based on the starting position data and dimension amendment data which were obtained.
[0010] In invention according to claim 1, said printing cylinder is a 2 double drum which equips the hoop direction of the printing cylinder concerned with two printing fields, and invention according to claim 2 is characterized by calculating the starting position data of a proper for every printing field.
[0011] In invention according to claim 1 or 2, said printing cylinder is a 2 double drum which equips the hoop direction of the printing cylinder concerned with two printing fields, and invention according to claim 3 is characterized by calculating the dimension amendment data of a proper for every printing field.
[0012] Invention according to claim 4 is characterized by attaining amendment of the dimension of the image in said printing cylinder hand of cut by changing the rotational speed of a printing cylinder in invention according to claim 1 to 3.
[0013] Invention according to claim 5 is set to invention according to claim 1 to 4. Said input means It is what furthermore inputs the amount of location gaps of the image pars intermedia between said image upper limit section and the image lower limit section. Said dimension amendment data operation means It is what calculates the 1st partial dimension amendment data which amends the dimension of the partial image from said image upper limit section in a printing cylinder hand of cut to image pars intermedia based on the inputted amount of location gaps, and the 2nd partial dimension amendment data which amends the dimension of the partial image from said image pars intermedia to the image lower limit section. It is characterized by amending the dimension of the image recorded with said image recording means for every part based on the 1st partial dimension amendment data and the 2nd partial dimension amendment data which were obtained.
[0014] Invention according to claim 6 is characterized by changing the rotational speed of a printing cylinder bordering on said image pars intermedia in invention according to claim 5 based on said 1st and 2nd partial dimension amendment data.
[0015] In invention according to claim 5 or 6, invention according to claim 7 establishes two or more points of said image pars intermedia, and is characterized by performing dimension amendment of the image in the field between each image pars intermedia.
[0016] In invention according to claim 1 to 7, invention according to claim 8 is characterized by measuring the amount of location gaps in the printing cylinder hand of cut of the positioning mark concerned by said amount of location gaps while said image recording means forms a positioning mark in the image upper limit section and the image lower limit section.

[0017] Invention according to claim 9 is characterized by recalculating said starting position data in invention according to claim 1 to 8 according to amendment of the dimension of said image.
[0018] Invention according to claim 10 is set to invention according to claim 1 to 9. Said input means It is what inputs the amount of location gaps of the printed matter furthermore measured in two places of the image left end section and the image right end section in the direction of an axis of a printing cylinder. With said inputted amount of location gaps of two places The longitudinal-direction starting position data which define the starting position in the direction of a plate cylinder shaft line at the time of image recording, It is characterized by amending the record location in the direction of a plate cylinder shaft line of the image which calculates the longitudinal-direction dimension amendment data which amend the dimension of the image in the direction of a plate cylinder shaft line, and records them with said image recording means based on the obtained data.
[0019] Invention according to claim 11 is characterized by having an image pick-up means to picturize the image on a print sheet, and a measurement means to measure the amount of location gaps from the obtained image data, in an airline printer in invention according to claim 1 to 10.
[0020] Invention according to claim 12 is equipped with an image recording means to record an image on the printing version on a printing cylinder based on the image data which constitutes printed matter. A printing conditioning means to be the airline printer which can amend the record location of said image, and to set up printing conditions, An input means to input the amount of location gaps of the printed matter printed according to said printing conditions, A location amendment data operation means to calculate the location amendment data which amend the record location of an image based on said inputted amount of location gaps, It has a storage means to memorize said location amendment data corresponding to said printing conditions, location amendment data are chosen from said storage means according to printing conditions, and it is characterized by amending the record location of said image based on the selected location amendment data concerned.
[0021] Invention according to claim 13 is characterized by said printing conditions containing at least one of the class of print sheet, the thickness of paper of a print sheet, the direction of the eye of paper, the order of a print color, and ******** in invention according to claim 12.
[0022] In invention according to claim 12 or 13, said printing cylinder is a 2 double drum equipped with two printing fields, and invention according to claim 14 is characterized by using the location amendment data which correspond for every printing field.
[0023] In invention according to claim 12 to 14, said airline printer is equipped with the blanket drum which imprints an ink image from the printing version, and invention according to claim 15 is characterized by making to have exchanged or reequipped with the blanket of the blanket drum concerned into printing conditions.
[0024] Invention according to claim 16 is set to invention according to claim 12 to 15. It is characterized by for said airline printer to amend the record location of said image using the location amendment data with which it has a display means to display two or more location amendment data corresponding to said printing conditions, and the operator chose it from the displayed location amendment data.
[0025]
[Embodiment of the Invention] The gestalt of implementation of the 1st of this invention is explained based on a drawing below [the gestalt of the 1st operation]. Drawing 1 R> 1 is the side-face schematic diagram showing an example of the airline printer concerning this invention, and drawing 2 is the block diagram showing the control section which controls the whole airline printer concerned.
[0026] The 1st and 2nd printing cylinders 1 and 2 with which this airline printer holds the printing version as a print station as shown in drawing 1 , The 1st and 2nd blanket drums 3 and 4 for imprinting an ink image from each printing cylinder, The impression cylinder 5 which holds a print sheet and contacts both the blanket drums 3 and 4, and the feed drum 6 and the delivery drum 7 which supply or discharge a print sheet to an impression cylinder 5, It has the delivery unit 11 which carries out sequential loading of the dampening water supply means 8 and the ink supply

means 9 of supplying dampening water or ink to said 1st and 2nd printing cylinders 1 and the printing version on two, the feed section 10 which carries out sequential supply of the loaded non-printed print sheet, and the printed print sheet.
[0027] On the other hand, this airline printer is equipped with the printing version feed zone 12 which supplies the unexposed printing version to said 1st and 2nd printing cylinders 1 and 2 as a platemaking device, the image recording section 13 which records an image to the printing version on a printing cylinder, the development section 14 which carries out the development of the printing version with which the image was recorded, and the printing version discharge section 15 which discharges the used printing version.
[0028] Moreover, this airline printer is equipped with the image pick-up section 16 for picturizing the image on the printed print sheet and measuring the amount of location gaps of the printed image, and the control section 17 for carrying out the image processing of the image obtained in said image pick-up section 16 while controlling each part of an airline printer to be shown in drawing 2 . Hereafter, the detail of each part is explained.
[0029] In between the image recording locations which show between the image recording locations shown with the printing cylinder drive which is not illustrated with the 1st printing position shown as the continuous line of drawing 1 , and a two-dot chain line with the 2nd printing position shown as the continuous line of drawing 1 , and a two-dot chain line with the printing cylinder drive which it is constituted so that it may be movable, and is not similarly illustrated about the 2nd printing cylinder 2, the 1st printing cylinder 1 is constituted so that it may be movable. That is, the 1st and 2nd printing cylinders 1 and 2 are arranged in the 1st or 2nd printing position, respectively, when performing printing, when doing a platemaking activity, a sequential shift is carried out, it is arranged in an image recording location, and platemaking processing of the printing version is performed on each printing cylinder.
[0030] This the 1st printing cylinder 1 and 2nd printing cylinder 2 have the peripheral surface which can hold the printing version of 2 classification by color, respectively, and it equips them at a time with 2 sets of **** means which are not illustrated for fixing the printing version of each color to the location which countered 180 degrees on that peripheral surface. Drawing 8 is a printing cylinder 1 and the explanatory view showing the example which it equipped at a time with the two printing versions which have one printing field respectively on two. The printing field PR which records an image on the printing version as shown in drawing is arranged, and the image IM for every color and the register marks R1-R4 for aim doubling arranged at the four sides are recorded on each printing field PR.
[0031] In addition, although he is trying to equip a printing cylinder at a time with the two printing versions which have one printing field with the gestalt of the above-mentioned implementation, you may make it equip with the printing version of one sheet which installs two printing fields successively.
[0032] It returns to drawing 1 , and the 1st blanket drum 3 is constituted so that it may rotate in contact with the 1st printing cylinder 1 in said 1st printing position, and it is constituted so that it may rotate in contact with the 2nd printing cylinder 2 similarly about the 2nd blanket drum 4 in said 2nd printing position. These 1st and 2nd blanket drums 3 and 4 had the same diameter as said 1st and 2nd printing cylinders 1 and 2, and have equipped that peripheral surface with the blanket which can imprint the ink image of 2 classification by color from each printing cylinder.
[0033] An impression cylinder 5 has one half of the diameters of said 1st and 2nd printing cylinders 1 and 2, and it is constituted so that it may rotate in contact with both 1st and 2nd blanket drums 3 and 4. This impression cylinder 5 is equipped with the **** means which can one-sheet hold the print sheet of the magnitude corresponding to the printing field on said printing version and which is not illustrated. This **** means can be opened and closed to predetermined timing, and can pinch said print sheet by the breaker style which is not illustrated.

[0034] The feed drum 6 and the delivery drum 7 have the same diameter as an impression cylinder 5, and are equipped with the **** means with which said impression cylinder 5 was equipped, and the same **** means which is not illustrated. The **** means of this feed drum 6 and the delivery drum 7 is arranged so that a print sheet can be delivered synchronizing with the

**** means of said impression cylinder 5.
[0035] Each gear meshes between the drums which the body end is equipped with the drive gear on which the same magnitude as the diameter of each drum does not illustrate the 1st and 2nd printing cylinders 1 and 2 arranged in the 1st and 2nd printing positions of the above, the 1st and 2nd blanket drums 3 and 4, an impression cylinder 5, and the feed drum 6 and the delivery drum 7 to each drum, and it contacts respectively. Therefore, the rotation drive of each above-mentioned drum can be synchronously carried out by driving by the motor for a printing drive which does not illustrate this gear.
[0036] In addition, in the airline printer of the gestalt of this operation, since printing cylinders 1 and 2 and the blanket drums 3 and 4 have the twice as many perimeter as this to an impression cylinder 5, whenever printing cylinders 1 and 2 and the blanket drums 3 and 4 rotate one time, an impression cylinder rotates two times. Therefore, if it rotates two times while the impression cylinder 5 had held the print sheet, two every colors each of process printing of a total of four colors can be performed from the 1st and 2nd printing cylinders 1 and 2.
[0037] 2 sets of dampening water supply means 8 are arranged at a time to each printing cylinders 1 and 2 in the 1st and 2nd printing positions, respectively, and can supply dampening water alternatively to each printing cylinder 1 and the two printing versions on two. The roller which this dampening water supply means 8 consists of a water tub which stores dampening water, and a dampening water roller group which pumps up the dampening water in a water tub and is passed to a form plate, and contacts a form plate at least among dampening water rollers is constituted so that it may contact or estrange to a printing cylinder side by the cam mechanism which is not illustrated. In addition, if the printing version is the printing version of the type which makes dampening water unnecessary, the dampening water supply means 8 will become unnecessary.
[0038] 2 sets of ink supply means 9 are arranged at a time to each printing cylinders 1 and 2 in the 1st and 2nd printing positions, respectively, and can supply the ink of an alternatively different color to each printing cylinder 1 and the two printing versions on two. For example, with the gestalt of this operation, to the 1st printing cylinder 1, the ink supply means 8 of K color (black) and M color (Magenta) is arranged, and the ink supply means 8 of C color (cyanogen) and Y color (yellow) is arranged to the 2nd printing cylinder 2.
[0039] The roller which this ink supply means 9 consists of an ink jar means to store ink, and an inking-roller group which scours and passes the ink which it let out from the ink jar means, and contacts a form plate at least among inking rollers is constituted so that it may contact or estrange to a printing cylinder side by the cam mechanism which is not illustrated.
[0040] In addition, with migration of said 1st and 2nd printing cylinders 1 and 2, some of dampening water supply means 8 and ink supply means 9 are constituted so that the moving trucking can be shunted.
[0041] The feed section 10 has picked out one sheet of print sheet at a time from the pile loading an intact print sheet, passes it to the feed drum 6, and with the gestalt of this operation, it operates so that a 1-time print sheet may be supplied every two rotations of a feed drum. Moreover, the printed print sheet is received from the delivery drum 7, and a delivery unit 11 loads it.
[0042] Next, the platemaking device of this airline printer is explained. In this airline printer, when doing a platemaking activity, the 1st and 2nd printing cylinders 1 and 2 are moved to an image recording location by turns. A friction roller is contacted to a printing cylinder, and it consists of this image recording location so that a rotation drive may be carried out. About this, it mentions later using drawing 4 .
[0043] The printing version feed zone 12 has the cassette roll which shaded and kept the roll-like unexposed printing version, the conveyance roller and conveyance guide with which even printing cylinders 1 and 2 convey the pulled-out printing version, and a cutting means to cut said printing version in the shape of a sheet. Although the silver salt sensitized material which carries out exposure record of the image by the laser beam as a printing version is used with the gestalt of this operation, the printing versions, such as melting or a thermal type by which ablation is carried out, may be used, for example with laser.

[0044] In addition, a **** means by which said printing cylinders 1 and 2 do not illustrate the tip of the printing version first pulled out from said cassette roll is made to pinch it, and the supply operations sequence of the printing version rotates printing cylinders 1 and 2 in this condition, it cuts the printing version for the printing version by predetermined length winding and after this on a printing cylinder 1 and 2, and pinches the back end of the printing version with the **** means of another side.
[0045] By on/off of a laser beam, the image recording section 13 is exposed on the printing version, and records an image. About this image recording section 13, it mentions later using drawing 4 .
[0046] The development section 14 carries out the development of the printing version exposed by said image recording section 13. It has the composition of pumping up the processing liquid stored by the processing tub which the development section 14 does not illustrate with the gestalt of this operation with a spreading roller, applying to the printing version, and performing a development, and has a rise-and-fall means which is not illustrated to move to the location which shunts a printing cylinder, and the location which approaches to a printing cylinder. In addition, as long as it adopts the image recording approach that a development is not needed, there may not be the development section 14.
[0047] In this airline printer, the 1st and 2nd printing cylinders 1 and 2 are moved to an image recording location, record and development of supply of the printing version and an image are performed, and a platemaking activity is done. If a platemaking activity is completed, the 1st and 2nd printing cylinders 1 and 2 can be arranged to the 1st and 2nd printing positions, respectively, and printing can be performed.
[0048] On the other hand, this airline printer can discharge the printing version automatically after termination of printing. The printing version discharge section 15 is equipped with an exfoliation means to exfoliate the printing version from the printing cylinder in an image recording location, a conveyance means to convey the exfoliative printing version, and the discharge cassette that discharges the conveyed used printing version with the gestalt of this operation.
[0049] Next, the configuration of the image pick-up section 16 is explained using drawing 3 . In addition, drawing 3 is the side-face schematic diagram of the image pick-up section 16 and a delivery unit 11. A delivery unit 11 consists of a delivery base 32 for loading the print sheet S conveyed by two or more **** means 31 and these **** means 31 for being conveyed with the chain 30 of the shape of endless [two] hung about between said delivery drum 7, this delivery drum 7, and 2 pairs of gear 7' of approximately the same diameter, and these two chains, and conveying a print sheet S first.
[0050] The both ends of said delivery drum 7 are equipped with the gear section which is not illustrated for engaging with a chain 30, respectively, this gear section is countered and two gear 7' of approximately the same diameter is arranged. And the endless-like chain 30 is hung about in the gear section of the delivery drum 7, and gear 7'. The die length of this chain 30 is set as the die length of the integral multiple of the perimeter of said delivery drum 7.
[0051] The **** means 31 has the claw part material in which the closing motion for pinching the tip of a print sheet S is possible, and two or more **** means 31 are being fixed over between said two chains. Spacing of this **** means 31 is equivalent to the perimeter of said delivery drum 7. The **** means 31 synchronizes with rotation of said delivery drum 7, and runs in the shape of a loop formation. On the other hand, each **** means 31 is constituted so that it may open and close by the cam mechanism which is not illustrated synchronizing with the **** means which was formed in said delivery drum 7 and which is not illustrated, and it receives a print sheet S from the delivery drum 7. Moreover, opening and closing the **** means 31 by the cam mechanism which is not illustrated on the delivery base 32, it discharges a print sheet S.
[0052] The delivery base 32 is the pallet-like member which can load two or more print sheets S, and carries out vertical migration with the rise-and-fall means which is not illustrated. That is, when the sequential delivery base 32 descends, the discharge height of a print sheet S can be fixed and discharge actuation of a print sheet S can be smoothly performed, as a print sheet S is discharged.

[0053] By the above-mentioned delivery unit 11, in order to pinch and convey the tip of a print sheet S with the **** means 31, the back end of a print sheet S is conveyed in the condition of not being fixed. For this reason, it generates with [of a print sheet S] **** with conveyance. With the gestalt of this operation, in order to control with [of this print sheet S] ****, it has the adsorption roller 33 which stabilizes the conveyance condition of a print sheet S in the front side of the delivery base 32.
[0054] This adsorption roller 33 equips that front face with many detailed adsorption holes, and is connected with the vacuum pump which is not illustrated. moreover, the adsorption roller 33 -- the roller axis -- said **** means 31 -- parallel -- becoming -- the lower part passage location of said chain 30, and abbreviation -- it is arranged so that the crowning of a roller may be located in the same height. In addition, the adsorption roller 33 carries out a rotation drive according to the transit rate of said **** means 31, or the chisel configuration of the rotation of it is enabled. Therefore, since a print sheet S will be in the condition that the adsorption roller front face was adsorbed and is conveyed in case it passes through the adsorption roller 33 top, a print sheet S does not fluster in the right above section of this adsorption roller 33. In addition, it may replace with the adsorption roller 33 and a tabular adsorption member which adsorbs said print sheet S superficially may be adopted.
[0055] The image pick-up section 16 consists of a lighting means 34 to illuminate the print sheet conveyed, and an image pick-up means 35 for picturizing the image on the illuminated print sheet and obtaining image data.
[0056] The lighting means 34 is arranged along with said adsorption roller 33, consists of two or more linear light sources which illuminate the print sheet on said adsorption roller 33, and is established between said chains 30. In addition, the slit for an image pick-up is formed in the center section of said light source.
[0057] The image pick-up means 35 is equipped with the case 36 for protection from light and protection against dust, and the mirror 37 arranged inside this case, a lens 38 and the CCD line sensor 39. This image pick-up means 35 picturizes the image of the print sheet on said adsorption roller 33 through the slit of said lighting means 34, and the incident light of the image turned up by the mirror 37 is received with the CCD line sensor 39 through a lens 38. In addition, a CCD line sensor reads an image corresponding to three colors of RGB. With the gestalt of this operation, the image on a print sheet will be read for every Rhine one by one with migration of a print sheet.
[0058] Next, the control section 17 shown in drawing 2 is explained. As shown in the block diagram of drawing 2 , it has the control section 17 for this airline printer to control each part of the airline printer containing said image recording section 13, the image pick-up section 16, etc. This control section 17 is connected to the image data origination equipment of the exterior which is not illustrated by LAN etc. so that it may consist of a computer system equipped with a storage means 43 by which an operator can store the display means 42, such as the input means 41, such as an operational keyboard, and a monitor, image data and various data, a program, etc. and the image data which should be printed may be received. This control section 17 processes the image data picturized in said image pick-up section 16 with control of each part of an airline printer.
[0059] Next, the configuration of the image recording section 13 is explained using drawing 4 . In addition, drawing 4 is the block diagram of the image recording section 13 and its periphery. In drawing, it is prepared in the printing cylinders 1 and 2 which are in a platemaking location first possible [contact] directly [the friction roller 51] or indirectly by the driving means which is not illustrated. The rotation drive of said friction roller 51 is carried out by the drive motor 53 through Motor Driver 52. Therefore, with the gestalt of this operation, the friction roller 51 can be rotated with a drive motor 53, it can follow to this, and the rotation drive of the printing cylinders 1 and 2 can be carried out. In addition, the roller quality of the material, contact pressure, etc. are set up so that slipping may not produce the contact to the friction roller 51 and printing cylinders 1 and 2.
[0060] On the other hand, the image recording section 13 is equipped with the laser light source 54 which irradiates the laser beam for record, and the polygon mirror 55 which deflects the laser

beam irradiated from a laser light source 54 toward the printing version as a means to record an image to a printing cylinder 1 and the printing version on two. Said laser light source 54 is equipped with semiconductor laser and its ambient light study system, carries out the on/off drive of the semiconductor laser, and is enabling spot exposure by the laser beam. The polygon mirror 55 is equipped with the page [5th] mirror plane which deflects a laser beam, and it is supported pivotable so that said laser beam may be scanned along the direction of an axis of printing cylinders 1 and 2. In addition, the rotation drive of the polygon mirror 55 is carried out by the drive motor 57 through Motor Driver 56.

[0061] Moreover, the image recording section 13 is equipped with the scan control circuit 58 for carrying out drive control of said drive motors 53 and 57, and the exposure control circuit 59 which controls said laser light source 54 based on image data.

[0062] The scan control circuit 58 is connected to two sensors 60a and 60b and oscillators 61 which detect the home position in rotation of printing cylinders 1 and 2, and the home position detecting signals za and zb and the reference clock signal cs are inputted from each. In addition, Sensors 60a and 60b are photo sensors which detect optically the detecting-element material which was installed in printing cylinders 1 and 2, and which is not illustrated, and they are formed in order [two] to detect the home position (P0 of drawing 10) to two printing fields on a printing cylinder. The following explanation uses together and explains drawing 1010 to an image recording starting position. In addition, drawing 10 is an explanatory view for explaining the physical relationship of the image recording starting position on the printing version.

[0063] It returns to drawing 4 and controls by said scan control circuit 58 based on each inputted signal to rotate said drive motor 53 at a predetermined rate through Motor Driver 52. That is, the input timing interval of the home position detecting signals za and zb can be counted by the reference clock signal cs, and the rotational speed of printing cylinders 1 and 2 can be controlled by carrying out feedback control of the drive motor 53 so that this number of counts may become a predetermined value to constant value. Moreover, he is trying for the scan control circuit 58 to control a drive motor 57 through said Motor Driver 56 to rotate the polygon mirror 55 at a predetermined rate.

[0064] He has set up the location where only the predetermined amount s1 of offset progressed in the direction of vertical scanning from the home position P0 of the direction of vertical scanning as an image recording starting position P1 of the direction of vertical scanning, and is trying to, amend location gap of the direction of vertical scanning of an image by changing said amount s1 of offset in the image recording section 13, on the other hand, as shown in drawing 10 . For this reason, the scan control circuit 58 generates the image recording start signal ys for setting up said image recording starting position P1 corresponding to said amount s1 of offset, and gives it to said exposure control circuit 59.

[0065] That is, the scan control circuit 58 counts the reference clock signal cs after the input of the home position detecting signals za and zb, and outputs the image recording start signal ys to the exposure control circuit 59 after the number-of-counts progress equivalent to the amount s1 of offset defined beforehand. Moreover, similarly, the image recording section 13 carries out time scattering of the time of counting the predetermined number of reference clock signals from a home position P0, considers as a location PE, and outputs the printing cylinder rotation stop signal ye.

[0066] The exposure control circuit 59 generates the dot clock signal dc which determines the timing which records an image inside based on the reference clock signal cs. And based on image data, said laser light source 54 is driven by the timing of said dot clock signal dc with the input of said image recording start signal ys as the starting point, and the laser beam for image recording is generated. This laser beam is scanned in the direction of an axis of a printing cylinder (main scanning direction) by the polygon mirror 55. In addition, in horizontal scanning of each laser beam, the start sensor 62 is formed so that the head location of a laser beam may be detected.

[0067] In this exposure control circuit 59, the image recording location of a main scanning direction can be amended like the amendment in said direction of vertical scanning. Drawing 5 is drawing for explaining the image recording starting position of the main scanning direction in the exposure control circuit 59. In the exposure control circuit 59, the timing memory 63 is prepared

corresponding to the location (address) of the main scanning direction which the polygon mirror 55 scans. Each address position of this timing memory 63 supports the location of the dot recorded on a main scanning direction.
[0068] In this device, read-out of said timing memory 63 is first started to the timing of said dot clock signal dc from the time of the exposure control circuit 59 detecting a laser beam by said start sensor 62. ((ST) The address of drawing 5)
[0069] When the contents of the timing memory 63 are data showing a recording start, the exposure control circuit 59 sends out the image data which should be recorded to a laser light source 54 one by one, and starts record. (Address XS of drawing 5) And if the contents of the timing memory 63 become data showing record termination, the exposure circuit 59 will end record. (Address XE of drawing 5)
[0070] By this device, the amount s2 of gaps of the record location even from said address ST to Address XS is equivalent to the amount s1 of offset in said direction of vertical scanning, and the field corresponding to address XS-XE turns into a record section in the main scanning direction of an image. Therefore, what is necessary is just to change the addresses XS and XE which write a recording start and termination data in said timing memory 63, when positioning an image to a main scanning direction.
[0071] In addition, with the gestalt of the above-mentioned implementation, although data are written only in the recording start location and termination location of an image, depending on the class of printing version, it burns off to the periphery of the printing version, and a field may have to be set to the timing memory 63. for example, in the case of the silver salt sensitized material of a positive type, the periphery of the printing version is exposed, and ink does not adhere -- being the so-called -- "-- it burns off and" processing is needed. Such when processing by burning off, it burns off in said timing memory 63, starts and burns, and flies, and termination data are written in. Then, it was set up and burns off, and in a field, said exposure control circuit 59 was prepared beforehand, is burned off, and should just record by the image data of business.
[0072] In addition, it burns off, it replaces with the image data of business, image data, various management data, a mark, for example, a color management chart etc., etc., is prepared, and you may make it record on the edge of the printing version.
[0073] Next, the positioning principle of the record location of the image in the airline printer concerning this invention is explained. With the gestalt of this operation, the amount s1 of offset from the home position P0 to the image recording starting position P1 [m] is set up by s1=yxn. y is the die length on the printing cylinder per one pulse of the reference clock signal cs, and n is the number of counts of the reference clock signal cs here. That is, a change of the amount s1 of offset is made by the change in number-of-counts n of said reference clock signal cs.
[0074] Moreover, said number-of-counts n shall be set up by n= (Cd/k+Co) with the gestalt of this operation. The default number of counts by which Cd was set up here at the time of shipment, and Co are the offset numbers of counts which an operator can arbitration set up. Moreover, k is a velocity coefficient in the case of carrying out adjustable [of the rotational speed of a printing cylinder]. Therefore, with the gestalt of this operation, the recording start location in the direction of vertical scanning will be amended by carrying out adjustable [of said offset number of counts Co] substantially. It becomes Co=s1/y-Cd/k from the above-mentioned operation expression.
[0075] In addition, die-length y for one pulse is called for as follows. When setting default rotational speed of a printing cylinder to Vd [rps] first and carrying out adjustable [of the rate of a printing cylinder], the multiplication of said velocity coefficient k is carried out, and it considers as k-Vd [rps]. Moreover, if the time interval for one pulse of L [m] and said reference clock signal cs is set to t [sec] for the perimeter of a printing cylinder, since the peripheral velocity on a printing cylinder will serve as L-k-Vd [m/sec], die-length [for reference clock signal 1 on a printing cylinder pulse] y [m] becomes y=t-L-k-Vd.
[0076] Next, the amendment procedure by the actually measured amount of location gaps is explained using drawing 6 and the flow chart of 7.
[0077] The flow chart of drawing 6 shows first the procedure which records an image on the

printing version. In drawing, various data are set by the control section 17 to the scan control circuit 58 or the exposure control circuit 59 at step S1. At step S2, printing cylinders 1 and 2 move to a platemaking location, and start rotation. The rate of a printing cylinder is adjusted by k-Vd, and if the rotational speed of a printing cylinder is stabilized, it will progress to step S3 here.

[0078] At step S3, if the reference clock signal cs is counted from the time of the scan control circuit 58 detecting the zero signals za or zb and the counted value concerned reaches number-of-counts n corresponding to the amount s1 of offset, it will be judged that it became the recording start location P1. Thereby, the recording start signal ys is outputted from the scan control circuit 58 to the exposure control circuit 59.

[0079] If it judges that it became the recording start location P1 at step S3, it will progress to step S4. The exposure control circuit 59 controls a laser light source 54 by this step S4 based on image data, and record of an image is performed.

[0080] At step S5, a control section 17 judges whether the scan control circuit 58 outputted the image recording terminate signal ye. If it judges that the control section 17 became an image recording termination location at step S5, rotation of a printing cylinder 12 will be suspended at the following step S6.

[0081] In addition, in the above-mentioned flow, although only record of the image to the one printing version on a printing cylinder is indicated, in fact, the above-mentioned procedure is repeated and the 2nd edition is recorded for every printing cylinder, respectively.

[0082] Next, the flow chart of drawing 7 shows the operation procedure of the data concerning positioning of said image, and drawing 7 (A) asks for dimension amendment data for drawing 7 (B) to amend the dimension of an image for the starting position data for amending an image recording starting position, respectively. In addition, only the number of print colors is performed according to an individual, and each procedure will calculate said starting position data and dimension amendment data for every printing field, if it is 2 double drum equipped with two printing fields.

[0083] In drawing 7 (A), the image on a print sheet is first read by said image pick-up section 16 at step S11. And at step S12, the image processing of the obtained image data is carried out by the control section 17, and the location of each register marks R1-R4 is calculated. And the amount of location gaps required for positioning of an image is calculated.

[0084] Drawing 9 (A) is drawing showing color gap of the image on the printed print sheet, and ** (B) and (C) are drawings showing location gap of each register marks R1 and R2 here. In addition, in drawing 9 (B) and (C), it is omitting about cyanogen and two colors of yellow only for black (Bk) and two colors of a Magenta (M). Moreover, in this example, only alignment of the image of the direction of vertical scanning is targetted.

[0085] In this example, the amount of location gaps of the direction of vertical scanning of M color to Bk color [in / for the amount of location gaps of the direction of vertical scanning of M color to BK color in the location of the register mark R1 / the location of a and the register mark R2] is set to b. Moreover, the dimension Y0 of the direction of vertical scanning used as the criteria between the register mark R1 based on image data and R2 is beforehand computed from image data, or the operator inputs it based on the last measurement.

[0086] In the above-mentioned example, the image recording starting position of the image of M color will have shifted [only said amount of location gaps +a] in the direction of vertical scanning to the image of Bk color. Moreover, to the image of Bk color (-a+b), the dimension error will have produced the image of M color as.

[0087] At step S13, said offset number of counts Co is calculated from the obtained amount of location gaps. To said operation expression, Co=s1/y-Cd/k, and y=t-L-k-Vd, this substitutes the measured amount a of location gaps for s1, and calculates it.

[0088] At step S14, while memorizing the obtained offset number of counts Co, let n=Cd/k+Co be starting position data.

[0089] The dimension amendment data of an image calculate in drawing 7 (B). First, at step S21 and step S22, the image on a print sheet is picturized like previous steps S11 and S12, and the required amount of location gaps calculates.

[0090] A velocity coefficient k calculates at the following step S23. In the above-mentioned example, to the dimension Y0 of criteria, since it is dressed-size Y=Y0+ (b-a), the rotational speed of a printing cylinder is adjusted by the ratio of velocity coefficient k=Y/Y0, and variable power of the dimension of the direction of vertical scanning is carried out. That is, with the gestalt of this operation, a velocity coefficient k is equivalent to the dimension amendment data which amend the dimension of an image.
[0091] The offset number of counts Co is recalculated at the following step S24. That is, since the velocity coefficient k is changed at previous step S23, rate k-Vd of a printing cylinder will also change gears. Therefore, in order to determine an image recording starting position, the amount of amendments by Cd default number of counts set up beforehand will be changed. Therefore, at this step S24, the offset number of counts Co is again calculated based on the obtained rate variable k. At step S25, the obtained velocity coefficient k and the offset number of counts Co are memorized.
[0092] The velocity coefficient k obtained in the procedure of drawing 7 (A) and (B) and the offset number of counts are memorized by the storage means as dimension amendment data and starting position data, and can be used at the time of the next printing / platemaking activity.
[0093] [the gestalt of the 2nd operation] -- the gestalt of this 2nd operation explains the gestalt which memorizes said starting position data, dimension amendment data, etc. corresponding to printing conditions (henceforth [it names generically and] location amendment data). With the gestalt of this operation, the database field which memorizes said starting position data and dimension amendment data is in the storage means 43. Drawing 11 is the explanatory view showing the example of a configuration of this database field.
[0094] As shown in drawing, as for the database field, the print sheet name A1, the thickness A2 of a print sheet, direction A3 of the eye of the paper of a print sheet, etc. are set up as printing conditions. It may be used, choosing the conditions inputted beforehand, and an operator may be made to input about such printing conditions. Starting position data and dimension amendment data which were obtained with the gestalt of the 1st operation in this database field are related with said printing conditions, and it memorizes according to a print color.
[0095] On the other hand, when newly engraving in printing, if the location amendment data which use printing conditions as a key and correspond from the above-mentioned database are selected automatically, location gap of the image accompanying change of printing conditions can be amended appropriately.
[0096] As long as there are no data corresponding to the same printing conditions at this time, you may make it select data with the nearest printing conditions in approximation, and may make it reason approximation-data from the existing data.
[0097] The priority is most simply attached to printing conditions, and priority is given to the same data and you may make it choose them from the high printing conditions of a priority. For example, in order that it may print with the class of print sheet and order may act greatly about the elongation of printed matter, these printing conditions are set up more highly [priority] than other printing conditions. And what is necessary is just to make sequential selection of the data which agree from the high printing conditions of a priority.
[0098] In addition, an airline printer does not set up automatically but an operator may be made to choose from the past data. As for said database, at this time, it is desirable to carry out sorting of the data by printing conditions or time series, and to enable a display for the display means 42. In addition, sorting is carried out by time series, because change of the amount of location gaps by secular change etc. can be expressed.
[0099] On the other hand, positioning amendment of the image by such location amendment data may have to be again adjusted, when blankets are exchanged. Therefore, as for said database, it is desirable to also add the exchange stage of a blanket as printing conditions. For example, you may make it lower the priority chosen even if other printing conditions are the same to the data from which a blanket exchange stage is different.
[0100] [The gestalt of other operations]
(1) Although the gestalt of implementation of the above 1st mainly explained positioning of the image in the direction of vertical scanning (printing cylinder hand of cut), this is because the

location gap of the image in the hand of cut of a printing cylinder is larger than location gap of the direction of an axis of a printing cylinder. About positioning of the image of a main scanning direction (the direction of an axis of a printing cylinder), it can carry out like positioning of said direction of vertical scanning. Namely, what is necessary is to read the amount of location gaps of the main scanning direction in the register marks R3 and R4 of an image on either side, and just to perform dimension amendment of the image recording starting position of a main scanning direction, and a main scanning direction to this value.

[0101] In addition, the former should just change the setting range of the record section by said timing memory 63 based on the amount of location gaps. Moreover, dimension amendment of a main scanning direction can be easily performed, if the rotational speed of the polygon mirror 55 is changed.

[0102] (2) With the gestalt of implementation of the above 1st, although he is trying to amend the dimension of the whole direction of vertical scanning, adjustable [of the rotational speed of a printing cylinder] is carried out for two or more division fields of every of the direction of vertical scanning, and it may be made to perform dimension amendment for every subregion. For example, the amount of location gaps of the direction of vertical scanning in the register marks R3 or R4 of drawing 8 is measured, and the amount of location gaps of the image of the direction of vertical scanning between the register mark R1 - R3 (R4) and the amount of location gaps of the image of the direction of vertical scanning between the register mark R3 (R4) - R2 are calculated. And to calculate a velocity coefficient k to each amount of location gaps, and what is necessary is just made to carry out adjustable [of the rotational speed of a printing cylinder] bordering on the vertical-scanning location of the register mark R3 (R4). Thereby, distortion of the direction of vertical scanning of an image can be amended.

[0103] (3) In order to simplify an equipment configuration, an operator may be made to input the value measured manually from the input means 41, such as a keyboard, although there is an advantage that actuation is easy, with the gestalt of implementation of the above 1st since a print sheet is picturized in the image pick-up section 16 and he is trying to calculate the amount of location gaps by the image processing.

[0104] (4) Although he is trying to detect measurement of the amount of location gaps from the location of a register mark established in four sides of peripheries of an image, it may measure gap of the image itself. However, it is [measurement] easier to have measured the amount of location gaps from the register mark, and a measurement result is stabilized, and it can be found. In addition, the edge (four corners) of an image may have each register mark.

[0105] (5) With the gestalt of this operation, although modification of the rotational speed of a printing cylinder is performing dimension amendment of an image, you may correspond by changing the period of a clock signal. Even in this case, it is necessary to recalculate the offset number of counts Co which determines an image recording starting position with periodic modification of a clock signal.

[0106]

[Effect of the Invention] According to invention according to claim 1, the record location of an image can be easily amended in inputting the amount of location gaps of two places, the image upper limit section of printed matter, and the image lower limit section.

[0107] According to invention given in claims 2 and 3, location gap of each printing field can be amended in the printing cylinder of 2 double drum.

[0108] According to invention according to claim 4, dimension amendment can be easily performed by changing the rotational speed of a printing cylinder.

[0109] Since according to invention given in claim 5 thru/or 7 a field is divided in image pars intermedia and dimension amendment can be performed for every field, it can respond, also when distortion of a printing cylinder hand of cut is in an image.

[0110] According to invention according to claim 8, since the positioning mark for the amount measurement of location gaps is prepared, the amount of location gaps can be measured easily.

[0111] According to invention according to claim 9, the gap of an image recording starting position which changes with dimension amendments of an image is correctable.

[0112] According to invention according to claim 10, the record location of the direction of an

axis of a printing cylinder can also be amended further.
[0113] According to invention according to claim 11, since it has an image pick-up means and a measurement means in an airline printer, it does not take the time and effort as which an operator measures and inputs the amount of location gaps manually.
[0114] According to invention given in claim 12 thru/or 16, since location amendment data are memorizable corresponding to printing conditions, various printing conditions are suited and a suitable record location can be amended.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the side-face schematic diagram showing an example of the airline printer concerning this invention.
[Drawing 2] It is the block diagram showing the configuration of the control section of this airline printer.
[Drawing 3] It is the side-face schematic diagram showing the configuration of the image pick-up section in this airline printer.
[Drawing 4] It is the block diagram showing the configuration of the image recording section in this airline printer.
[Drawing 5] It is an explanatory view for explaining positioning of the image of a main scanning direction.
[Drawing 6] It is the flow chart which shows the image recording procedure in this airline printer.
[Drawing 7] It is the flow chart which shows the operation procedure of the starting position data for amending the location of an image, and dimension amendment data.
[Drawing 8] It is the explanatory view showing the printing version.
[Drawing 9] It is an explanatory view for explaining location gap of the image on a print sheet.
[Drawing 10] It is an explanatory view for explaining the image recording starting position of a main scanning direction.
[Drawing 11] It is an explanatory view for explaining memorizing location amendment data corresponding to printing conditions.
[Description of Notations]
1 1st Printing Cylinder
2 2nd Printing Cylinder
3 1st Blanket Drum
4 2nd Blanket Drum
5 Impression Cylinder
6 Feed Drum
7 Delivery Drum
9 Ink Supply Means
11 Delivery Unit
13 Image Recording Section
16 Image Pick-up Section
17 Control Section
41 Input Means
42 Display Means
43 Storage Means
51 Friction Roller
53 Drive Motor (for Printing Cylinder Rotation)
54 Laser Light Source
55 Polygon Mirror
57 Drive Motor (for Polygon Mirrors)

58 Scan Control Circuit
59 Exposure Control Circuit
60a, 60b Home position detection sensor
62 Start Sensor
63 Timing Memory
cs Reference clock signal
k Velocity coefficient
s1 The amount of offset (the direction of vertical scanning)
s2 The amount of offset (main scanning direction)
R1-R4 Register mark
PR Printing field
P0 Home position
P1 Image recording starting position
PE Image recording termination location
Co Offset number of counts
Cd Default number of counts
Vd Default rotational speed

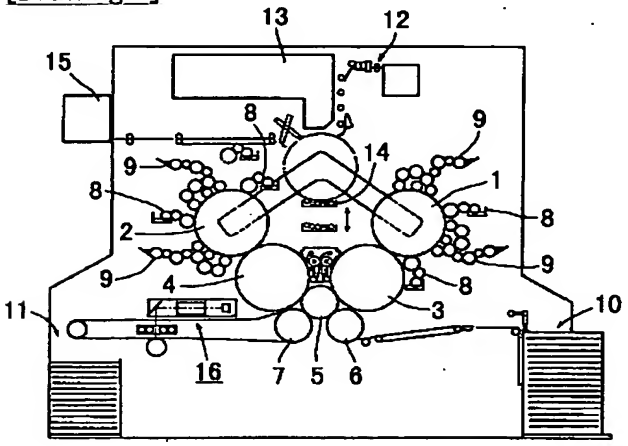
[Translation done.]

* NOTICES *

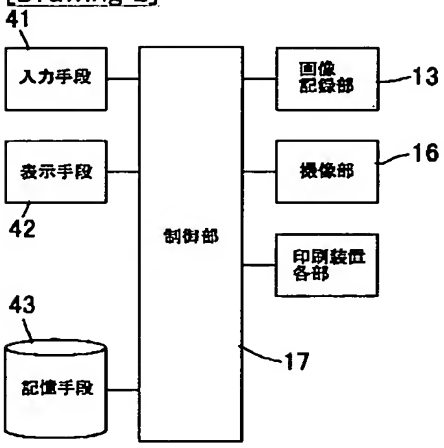
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

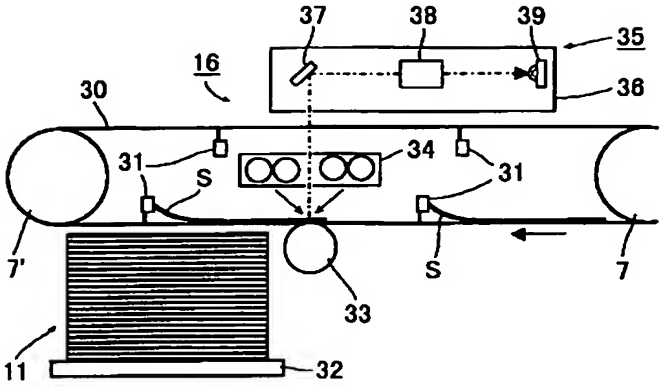
[Drawing 1]



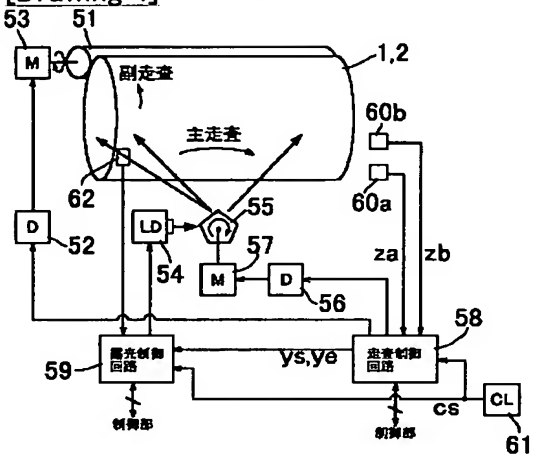
[Drawing 2]



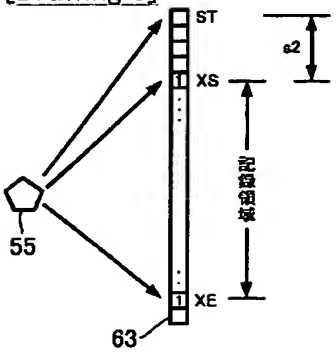
[Drawing 3]



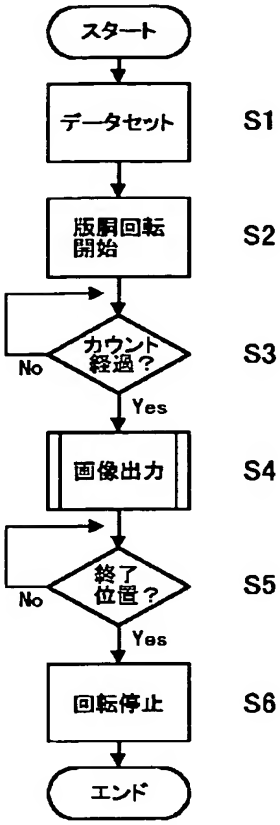
[Drawing 4]



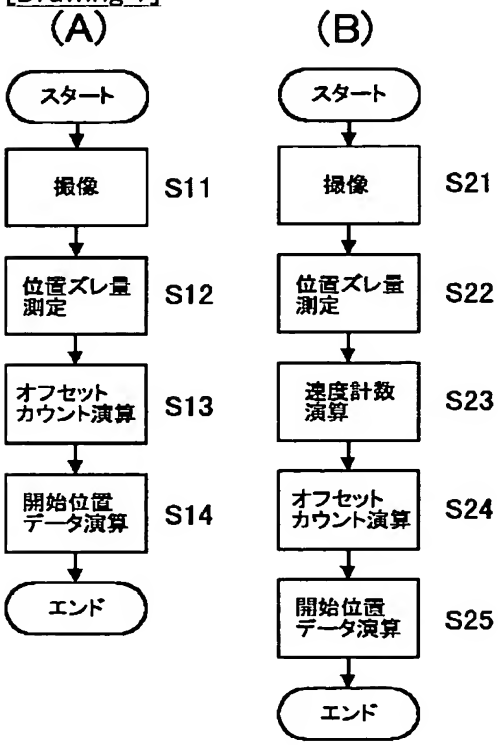
[Drawing 5]



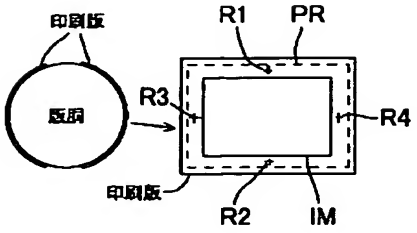
[Drawing 6]



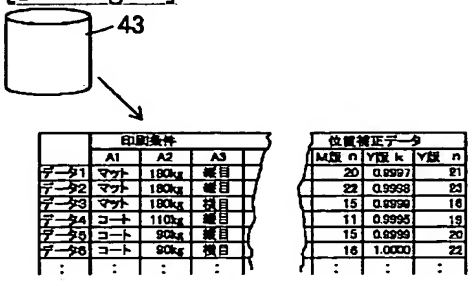
[Drawing 7]



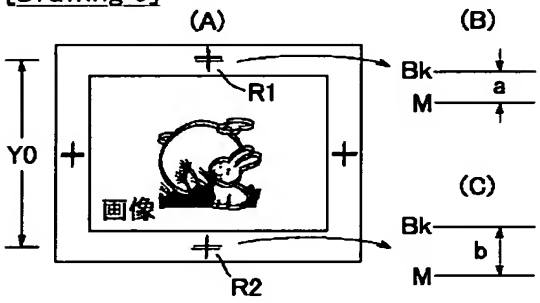
[Drawing 8]



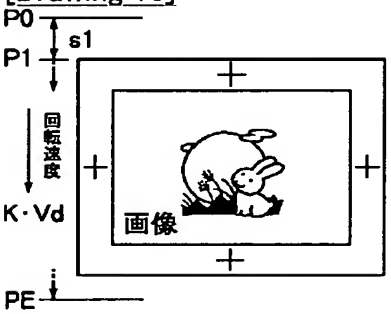
[Drawing 11]



[Drawing 9]



[Drawing 10]



[Translation done.]